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EXAMINER	
CHOU, ALBERT T	
ART UNIT	PAPER NUMBER
2662	

DATE MAILED: 02/24/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/826,464	TERRY, STPHEN E.
	Examiner	Art Unit
	Albert T. Chou	2662

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE ____ MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 April 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-17* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-17* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *05 April 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-6 and 8-13 are rejected under 35 U.S.C. 102(e) as being anticipated by Scott (US Patent Number: 6,094,421), hereinafter referred to as Scott.

3. Regarding claims 1 and 5, Scott teaches a **Communication System 301** (Figure 3A; col. 6, lines 57-65; *A communication system*) for communication among a plurality of **User Stations 302** and a plurality of **Cells 303**, each with a **Base Station 304** (Figure 3A; col. 6, lines 57-65; *for supporting base station BS / mobile terminal MT wireless bi-directional communications via the utilization of a radio frame format having sequentially identified system radio frames*), comprising:

A **Base Station 304** (Figures 3A & 8A; col. 5, lines 57-65; col. 16, lines 48-53; *a BS*) having:

- A **Transmitter 807** modulates the data for communication and transmits the data targeted for each **User Station 302** in the proper transmit time

slot (Figures 3A and 8A; col. 17, lines 22-24; _a transmitter for transmitting selectively formatted communication data to MTs within system radio frames_), and

- A **Receiver 809,** which is coupled with the **Antenna 808**, receives data from the **User Station 302** (Figures 3A & 8A; col. 17, lines 38-46; _a receiver for receiving communication data from MTs within system radio frames_);
- The **Base Station 304** comprises a **Propagation Delay Calculator 812** (Figure 8A; col. 18, lines 3-13; _BS receiver having an associated processor_) for calculating the timing difference between the time of actual receipt of the responsive message from the **User Station 302**, and the amount of time equal to the time past the beginning of the appropriate receive time slot (Col. 18, lines 8-13; _for measuring timing deviation TD of received MT transmissions in identified radio frames in which communications data is received from a selected MT_);
- A **Timing Command Unit 806** (Figure 8A; col. 17, lines 13-17; _a timing advance TA signal generator associated with BS_) formats the data to be transmitted, including a **Timing Adjustment Command 815** if necessary, to the **User Station 302** (Figure 8A; col. 17, lines 13-17; _for providing TA command signals for transmission by said BS to selected MTs_);
- The **Timing Command Unit 806** (Figure 8A; col. 17, lines 13-17; _TA signal generator_), coupling to **Propagation Delay Calculator 812** (Figure 8A; col. 18, lines 3-13), constructs **Timing Adjustment Commands 815**

(Figure 8A; col. 17, lines 13-17; *generates TA command signals*), based on the output of the **Propagation Delay Calculator 812** (Figure 8A; col. 18, lines 14-16; *TA data is calculated based upon measured TD in an identified radio frame for a selected MT*), which include: Message formats (Figures 12A-C; *TA data*) used for **Base Station 304** and **User Station 302** transmission (Col. 45, lines 22-45) with a **PID** field for echoing the identification number received from the **User Station 302** (Figure 12B; Table 12B-2; col. 46, lines 45-57; *a Connect Frame Number CFN specifying a particular radio frame for effectuating a timing adjustment by the selected MT*); and

- The **Propagation Delay Calculator 812** (Figure 8A; col. 18, lines 3-13; *BS processor*) calculates the timing difference between the time of actual receipt of the responsive message from the **User Station 302** (*from a selected MT*), and the amount of time equal to the time past the beginning of the appropriate receive time slot (Col. 18, lines 8-13; *measuring the TD for communication data received from a selected MT to which a TA command signal had been transmitted*). The **Timing Command Unit 806** (Figure 8A; col. 17, lines 13-17) transmits a TA command (Figure 8A, col. 17, lines 13-17; *to which a TA command signal had been transmitted*), based on the TD calculated by the **Propagation Delay Calculator 812,** using the **Base Specific Poll** message with the **PID** field for echoing the identification number received from the **User Station 302** (Figure 12B; Table 12B-2; col. 46, lines 45-57; *a TA command signal had been*

transmitted in the frame specified in the CFN of the transmitted TA command signal).

4. Regarding claims 2, 4, 6 and 9, Scott teaches that the **Base Station 304,** which comprising the **Propagation Delay Calculator 812** and the **Timing Command Unit 806** (Figure 8A), compares the actual time of receiving the reply message from **User Station 302** with the expected time of reception and determines how far away the **User Station 302** is. In the subsequent time frames, the **Base Station 304** may command the **User Station 302** to advance or retard its timing as necessary (Figure 8A; col. 11, lines 1-8; col. 17, lines 15-17; *TA command signal generator generates a TA command signal for a selected when a transmission received from the selected MT does not fall within a selected timing synchronization range*).

5. Regarding claims 3, 8 and 10 Scott teaches a **Communication System 301** (Figure 3A; col. 6, lines 57-65; *A communication system*) further comprising a plurality of **User Stations 302** (Figures 3A & 9; col. 6, lines 57-65; *at least one mobile terminal MT*) having:

- A **Transmitter 907**, obtaining the timing information from either the **Mode Control 910** or directly from the **TDD State Control 911** (Figures 3A & 9; *a transmitter and an associated MT processor*), modulates the data for communication and transmits the data to the **Base Station 304** in the proper transmit time slot (Figures 3A & 9; col. 19, lines 19-23; *for transmitting selectively formatted communication data to a BS within system radio frames synchronized by said MT processor*); and

- A **Receiver 909,** which is coupled to the **Antenna 908**, receives data from the **Base Station 304** (Figures 3A & 9; col. 19, lines 31-43; *a receiver for receiving communication data from a BS within system radio frames*); and
- A **Timing Command Interpreter 906** (Figure 9; col. 19, lines 40-45; *said MT processor*) parses the data received from the **Base Station 304** to determine the timing adjustment command (Figure 9; col. 19, lines 43-45; *TA data in a received TA command signal commencing in the radio frame specified in the CFN of the received TA command signal*). If the timing adjustment command is an instruction to advance timing by an amount of time T, then the **Timing Command Interpreter 906** may reset the **TDD State Control 911** at a period of T just prior to the elapsing of the current time frame (Figure 9; col. 19, lines 51-55; *MT processor adjusting the timing of the communication data transmitted by said MT transmitter in response to TA data in a received TA command signal*).

6. Regarding claim 11, Scott teaches a method of synchronizing communication data at the **Base Station 304** for **Communication System 301** (Figure 3A; col. 6, lines 57-65; *A communication system*) for communication among a plurality of **User Stations 302** and a plurality of **Cells 303**, each with a **Base Station 304** (Figure 3A; col. 6, lines 57-65; *for supporting base station BS / mobile terminal MT wireless bi-directional communications via the utilization of a radio frame format having sequentially identified system radio frames*), the method comprising: :

- Using the **Propagation Delay Calculator 812** in **Base Station 304** (Figure 8A; col. 18, lines 3-13) for calculating the timing difference between the time of actual receipt of the responsive message from the **User Station 302**, and the amount of time equal to the time past the beginning of the appropriate receive time slot (Col. 18, lines 8-13; *measuring timing deviation TD of communication data received from a selected MT by the BS)*;
- Using the **Timing Command Unit 806** (Figure 8A; col. 17, lines 13-17), coupled to **Propagation Delay Calculator 812** (Figure 8A; col. 18, lines 3-13), to generate a **Timing Adjustment Command 815** (Figure 8A; col. 17, lines 13-17; *generates TA command signals*), based on the output of the **Propagation Delay Calculator 812** (Figure 8A; col. 18, lines 14-16; *TA data is calculated based upon the measured TD of the communication data received from the selected MT*), with one of the message formats in 12A-c Tables (Figures 12A-C; *TA data*) which includes the **PID** field for echoing the identification number received from the **User Station 302** (Figure 12B; Table 12B-2; col. 46, lines 45-57; *a Connect Frame Number CFN specifying a particular radio frame for effectuating a timing adjustment by the selected MT*);
- Transmitting the data targeted for each **User Station 302** in the proper transmit time slot (Figures 3A and 8A; col. 17, lines 22-24; *transmitting the TA command to the selected MT*);

- The response message to TA command sent by the **User Station 302** is received by the **Receiver 809** and provided to the **Propagation Delay Calculator 812** (Figure 8A; col. 18, lines 1-3). The **Propagation Delay Calculator 812** then calculates a new **Timing Adjustment Command 815** for the particular **User Station 302** (Figure 8A; col. 18, lines 14-16; *adjusting the timing of communication data transmitted by the selected MT in response to the TA command based on the TA data and commencing in the radio frame specified by the CFN of the received TA command signal*);
- Using the **Propagation Delay Calculator 812** in **Base Station 304** (Figure 8A; col. 18, lines 3-13) for calculating the timing difference between the time of actual receipt of the responsive message from the **User Station 302**, and the amount of time equal to the time past the beginning of the appropriate receive time slot (Col. 18, lines 8-13; *measuring the TD for communication data received from the selected MT in the radio frame specified by the CFN of the transmitted TA command signal*).

7. Regarding claims 12 and 13, Scott teaches the **Timing Adjustment Command 815** as often as necessary to maintain a sufficient quality of communication (Col. 18, lines 25-26; *repeating steps b) – e)*) between the **Base Station 304** and all of the **User Stations 302** (Col. 18, lines 26-28; *when the measured TD of a transmission received from the selected MT in step e) does not fall within the selected timing synchronization range*).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claims 7 and 14-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Scott (US Patent Number: 6,094,421), hereinafter referred to as Scott, in view of Dahlman et al. (US Patent Number: 6,526,039), hereinafter referred to as Dahlman.

10. Regarding claim 7, Scott teaches a **Communication System 301** (Figure 3A; col. 6, lines 57-65) for communication among a plurality of **User Stations 302** and a plurality of **Cells 303**, each with a **Base Station 304** (Figure 3A; col. 6, lines 57-65). Scott also teaches that **Base Station 304** comprising a **Propagation Delay Calculator 812** (Figure 8A; col. 18, lines 3-13; *BS receiver having an associated processor*) for measuring timing deviation TD for communication data received from a selected MT and a **Timing Command Unit 806** (Figure 8A; col. 17, lines 13-17; *a timing advance TA signal generator associated with BS*) for generating a TA command signal to a selected **MT**. However, Scott does not disclose a geographic locator associated with the **Base Station Controller** and **Base Station** such that measured TD by one or more of Base Station Processors with respect to data received from a selected **MT** provides a basis for calculating the geographic location of the selected **MT** during

the specific time frame in conjunction with the TA data of a most recent successful TA command signal issued by the BS controller to the selected **MT**.

Dahlman teaches (Figure 2) each of MS operating in the **Mobile Communication System 200** will transmit its measured **RTD** (Relative Time Difference between the source **BS** and each of the **BSs** on the neighboring cell list; col. 4, lines 30-44) estimate on a periodic basis, or on demand, to the **BSC 204** via **BS1** (Col. 8, lines 38-40). The **BSC 204** stores the **RTD** estimates received from the **MSs** in an **RTD** estimate table (Col. 8, lines 41-42) and the values stored in the tables are then sent to other **MSs**, along with the neighbor cell list, to assist in synchronizing those **MSs** with neighboring **BSs** as necessary (Col. 8, lines 51-54). The **RTD** estimate can be used to determine the position of the **MS** (Col. 8, lines 60-61; _a geographic locator associated with said BS controller and said BSs_) because the mobile positioning essentially relies upon a determination of the propagation delay between the **MS** and each of a plurality of **BSs** or upon **TOA** (Time of Arrival; col. 3, lines 14-39) or **TDOA** (Time Difference of Arrival; col. 3, lines 14-39) measurements among the various **BSs** (Col. 8, lines 60-65; col. 9, lines 9-21; Figure 5, Steps 508-514).

It would have been obvious for one of ordinary skill in the art at the time of invention was made to modify Scott's **Propagation Delay Calculator 812** (_BS processor measuring Time Deviation TD_) and **Timing Command Unit 806** (_generating Time Advance TA signal_) to provide a basis for calculating the geographic location of the selected **MT** during the specific time frame as suggested by Dahlman that this positioning method is the simplest to implement

because it involves very little change in the mobile radio design (Col. 3, lines 40-46).

11. Regarding claim 14, Scott teaches a method of synchronizing communication data at the **Base Station 304** for **Communication System 301** (Figure 3A; col. 6, lines 57-65; _A communication system_) for communication among a plurality of **User Stations 302** and a plurality of **Cells 303**, each with a **Base Station 304** (Figure 3A; col. 6, lines 57-65), the method comprising:

- Outputting the timing command provided by the **Timing Command Unit 806** (Figure 8A; col. 17, lines 13-17) with a **Timing Adjustment Command 815** (Figure 8A; col. 17, lines 13-17; _communicating timing advance TA command signals_) to each targeted **User Station 302** in the proper transmit time slot (Figures 3A and 8A; col. 17, lines 22-24; _to a selected MT_) with one of the message formats in 12A-c Tables (Figures 12A-C; _TA data_), which includes the **PID** field for echoing the identification number received from the **User Station 302** (Figure 12B; Table 12B-2; col. 46, lines 45-57; _Signals include TA data and a Connect Frame Number CFN specifying a particular radio frame for effectuating a timing adjustment by the selected MT_);
- Using the **Propagation Delay Calculator 812** in **Base Station 304** (Figure 8A; col. 18, lines 3-13) for calculating the timing difference between the time of actual receipt of the responsive message from the **User Station 302**, and the amount of time equal to the time past the beginning of the appropriate receive time slot (Col. 18, lines 8-13;

<u>*measuring timing deviation TD in each CFN specified radio frame of communication data received from a selected MT by a BS to determine whether each respective command signal was successful)*</u>; and

- Using the **Propagation Delay Calculator 812** in **Base Station 304** (Figure 8A; col. 18, lines 3-13) for calculating the timing difference between the time of actual receipt of the responsive message from the **User Station 302**, and the amount of time equal to the time past the beginning of the appropriate receive time slot (Col. 18, lines 8-13; <u>*measuring timing deviation TD of a received MT transmission from the selected MT in a selected radio frame by said BS);*</u>

However, Scott does not disclose that the measured TD from the selected radio frame and the TA data of a most recent successful TA command signal transmitted to the selected **MT** can be used to calculate the geographic location of the selected MT.

Dahlman teaches (Figure 2) each of **MS** operating in the **Mobile Communication System 200** will transmit its measured **RTD** (Relative Time Difference between the source **BS** and each of the **BSs** on the neighboring cell list; col. 4, lines 30-44) estimate on a periodic basis, or on demand, to the **BSC 204** via **BS1** (Col. 8, lines 38-40). The **BSC 204** stores the **RTD** estimates received from the **MSs** in an **RTD** estimate table (Col. 8, lines 41-42) and the values stored in the tables are then sent to other **MSs**, along with the neighbor cell list, to assist in synchronizing those **MSs** with neighboring **BSs** as necessary (Col. 8, lines 51-54). The **RTD** estimate can be used to determine the position of

the **MS** (Col. 8, lines 60-61; _using the measured TD from the selected radio frame and the TA data of a most recent successful TA command signal transmitted to the selected MT to calculate the geographic location for the selected MT_) because the mobile positioning essentially relies upon a determination of the propagation delay between the **MS** and each of a plurality of **BSs** or upon **TOA** (Time of Arrival; col. 3, lines 14-39) or **TDOA** (Time Difference of Arrival; col. 3, lines 14-39) measurements among the various **BSs** (Col. 8, lines 60-65; col. 9, lines 9-21; Figure 5, Steps 508-514).

It would have been obvious for one of ordinary skill in the art at the time of invention was made to modify Scott's **Propagation Delay Calculator 812** and **Timing Command Unit 806** to provide a basis for calculating the geographic location of the selected **MT** during the specific time frame as suggested by Dahlman that this positioning method is the simplest to implement because it involves very little change in the mobile radio design (Col. 3, lines 40-46).

12. Regarding claims 15-16, Scott does not disclose the timing deviation TD of communication data received for the selected **MT** by a second **BS** in the selected radio frame is measured and also used in the calculation of geographic location of the selected **MT**.

Dahlman teaches an improved **RTD** that accounts for the propagation delays of uplink and downlink signals (Figure 2; col. 9-10). The improved RTD is the difference between the time at which a first **BS** begins transmitting its downlink signal and the time at which a second **BS** (_time deviation TD of communication data received for the selected MT by a second BS in the selected_

radio frame is measured and used in the calculation of geographic location of the selected MT) begins transmitting its downlink signal (Figure 2; col. 9, lines 10-14).

It would have been obvious for one of ordinary skill in the art at the time of invention was made that TD received by a second **BS** is measured and used in the calculation of geographic location of the selected **MT** as taught by Dahlman in the method of Scott in order to enable the geographic locator function of the invention.

13. Regarding claim 17, Scott does not disclose the selected **MT** measures relative frame reception difference between cells and the cell reception difference measurements are also used in calculating geographic location.

Dahlman teaches an improved **RTD** that accounts for the propagation delays of uplink and downlink signals (Figure 2; col. 9-10). The improved **RTD** is the difference (*measures relative frame reception difference between cells*) between the time at which a first **BS** begins transmitting its downlink signal and the time at which a second **BS** begins transmitting its downlink signal (Figure 2; col. 9, lines 10-14).

It would have been obvious for one of ordinary skill in the art at the time of invention was made that the selected **MT** measures relative frame reception difference between cells and the cell reception difference measurements are used in the calculation of geographic location as taught by Dahlman in the method of Scott in order to enable the geographic locator function of the invention.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Albert T. Chou whose telephone number is 571-272-6045. The examiner can normally be reached on 8:30 - 17:00. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hassan Kizou can be reached on 571-272-3088. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

AC
Albert T. Chou

February 7, 2005

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